providing heat from one or more heaters to at least a portion of the formation;

allowing the heat to transfer from the one or more heaters to a part of the formation;

E1

controlling the heat such that an average heating rate of the part is less than about 1 °C per day in a pyrolysis temperature range of about 270 °C to about 400 °C;

wherein the part is heated in a reducing environment during at least some of the time that the part is being heated; and

producing a mixture from the formation.

E2

2149. (amended) The method of claim 2117, further comprising:

producing hydrogen (H_2) and condensable hydrocarbons from the formation; and

hydrogenating a portion of the produced condensable hydrocarbons with at least some of the produced hydrogen.

E3

2156. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

heating a first section of the formation to produce a mixture from the formation;

heating a second section of the formation;

controlling the heat such that an average heating rate of the first section or the second section is less than about 1 °C per day in a pyrolysis temperature range of about 270 °C to about 400 °C; and

recirculating a portion of the produced mixture from the first section into the second section of the formation to provide a reducing environment within the second section of the formation.

E4

2158. (amended) The method of claim 2156, wherein heating the first section or the second section comprises heating with at least one electrical heater.

2159. (amended) The method of claim 2156, wherein heating the first section or the second section comprises heating with at least one surface burner.

2160. (amended) The method of claim 2156, wherein heating the first section or the second section comprises heating with at least one flameless distributed combustor.

E4

2161. (amended) The method of claim 2156, wherein heating the first section or the second section comprises heating with at least one natural distributed combustor.

2162. (amended) The method of claim 2156, further comprising controlling a pressure and a temperature within at least a majority of the first section or the second section of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

E5

2164. (amended) The method of claim 2156, wherein heating the first section or the second section comprises:

heating a selected volume (V) of the hydrocarbon containing formation from one or more heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day *(Pwr)* provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate *(h)* of the selected volume is about 10 °C/day.

2165. (amended) The method of claim 2156, wherein heating the first section or the second section comprises transferring heat substantially by conduction.

2166. (amended) The method of claim 2156, wherein heating the first section or the second section increases a thermal conductivity of at least a portion of the first section or the second section to greater than about 0.5 W/(m °C).

E6

2178. (amended) The method of claim 2156, wherein the produced mixture comprises a non-condensable component, wherein the non-condensable component comprises hydrogen (H_2), wherein the hydrogen is greater than about 10 % by volume of the non-condensable component

E6

at 25 °C and 1 atmosphere absolute pressure, and wherein the hydrogen is less than about 80 % by volume of the non-condensable component at 25 °C and 1 atmosphere absolute pressure.

E7

2181. (amended) The method of claim 2156, further comprising controlling a pressure within at least a majority of the first section or the second section of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

2185. (amended) The method of claim 2156, further comprising:

providing hydrogen (H_2) to the first section or the second section to hydrogenate hydrocarbons within the first or second section; and

heating a portion of the first section or the second section with heat from hydrogenation.

2186. (amended) The method of claim 2156, further comprising:

producing hydrogen (H_2) and condensable hydrocarbons from the formation; and

E8

hydrogenating a portion of the produced condensable hydrocarbons with at least some of the produced hydrogen.

2187. (amended) The method of claim 2156, wherein heating the first section or the second section increases a permeability of a majority of the first section or the second section to greater than about 100 millidarcy.

2188. (amended) The method of claim 2156, wherein heating the first section or the second section increases a permeability of a majority of the first section or the second section such that the permeability of the majority of the first section or the second section is substantially uniform.

E9

5398. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

heating a first section of the formation to produce a mixture from the formation;

heating a second section of the formation;

controlling a pressure and a temperature within at least a majority of the first section or the second section of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure; and

introducing a portion of the produced mixture from the first section into the second section of the formation to provide a reducing environment within the second section of the formation.